MARINE REVIEW.

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Lake Freight Conditions.

There are two reasons why it is believed that lake freights have touched bottom at 20 cents on coal, and 40 cents from Escanaba and 50 cents from Lake Superior on ore. One reason is that these figures practically represent the cost of carrying freight by a large class of vessels, and the other is an improvement in conditions caused by sales of ore. While some shippers are looking for a break to 35 cents in the Escanaba rate, they will hardly attempt to force it. It could not very well be permanent and the recovery might go beyond the 40 cents that seems to have a chance of ruling for the present.

An example of the truth of the statement that the freights ruling represent the actual cost of carrying the cargo, a 3,000-ton steel steamer owned in Cleveland went to Escanaba light and returned with ore at 40 cents and her expenses exceeded her receipts just 32 cents. This was a modern steel steamer and the example furnishes a striking illustration of the condition of lake freights, and proves beyond conclusion that 2,000 ton steamers are losing money.

It is said that the Minesotan Iron Co., has sold 2,000,000 tons in all this season and this is 100,000 tons more than their sales last season. Despatches claim a recent sale of 100,000 tons by the Norrie, and 225,000 tons of the Pioneer's output has been reported sold. These and other sales make up the second largest transaction of the season. If the coal and grain movement were in as good condition as the ore movement will probably take on the coming week, lake freights would be only half-bad. To offset the improvement in ore is the advent of the whaleback fleet, but the ore movement to June 1 was 500,000 tons behind last year's movement.

Very little can be said of grain, as it can only be regarded as a sure quantity at certain times during the year. All kinds of complications are forecasted for coal shipments. It is claimed that a strike is imminent and that the Pittsburg district is on this account pushing shipments, which has caused a shortage of cars. Coal shippers claim the increase is the regular June movement, while from the West Superior comes a report that the receipts are light. It is said that few contracts have been made at the head of the lakes and that there is not enough faith in improvement of business conditions to warrant the filling of docks until transactions are closed. At 20 cents, however, there is not enough profit to cause any weakness if the worst in coal predictions is realized.

Some little faith is shown in an improvement in ore freights during the summer months by the fact that a small lot of ore was offered for several days from Escanaba to Ohio ports to September 1 at 40 cents. An owner of a 2,000 ton wooden steamer who had a chance at this laid up his steamer rather than take it.

Another example of profit and loss at present freights is being circulated around the lakes: Expense of a steamer for a round trip of twelve days about $1,500. On 80,000 bushels of corn at 1 cent and 2,500 tons of coal at 20 cents the gross receipts is $1,350, which would net the owner a loss of $150, or $12.50 a day.

Stocks of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store in regular elevators at the principal points of accumulation on the lakes, June 12, 1897:

	Wheat, bushels.	Corn, bushels.
Chicago	4,687,000	7,134,000
Duluth	2,027,000	8,000
Milwaukee	130,000	3,000
Detroit	33,000	47,000
Toledo	455,000	585,000
Buffalo	867,000	567,000
	8,199,000	8,344,000

As compared with a week ago, the above figures show, at the several points named, a decrease of 1,068,000 bushels of wheat and an increase of 813,000 bushels of corn.

The Editor of the Marine Review Abroad.

J. M. Mulrooney, editor of the Marine Review, sails from New York this week on the City of Berlin to attend the International Congress of Naval Architects and Marine Engineers to be held in London early in July. The arrangements are under the direction of the Institution of Naval Architects of Great Britain and the meeting promises to be of unusual interest and value. The proceedings of the meeting will be given in a series of letters from the editor, and the opportunity given members of visiting the British ship yards, will be used by him to gain information of new machinery and matters of value to ship builders of the United States.

Insurance Paid in Three Weeks.

The payment of insurance on a sunken vessel before an answer is filed in the case is unusual. The payment of the full $80,000 insurance on the Florida, by the McCurdy-Prime syndicate breaks the record for prompt returns in such cases. The Florida was lost on May 20 and was insured in the McCurdy-Prime syndicate for $80,000. This money was paid, June 12, to P. P. Miller, managing owner of the lost steamer, by Brown & Co., who represent the company in Buffalo. In acknowledgment of the prompt payment and satisfactory settlement, Mr. Miller in behalf of the owners sent the following letter:

"I am to-day in receipt of drafts, covering insurance in full on steamer Florida. On behalf of my associates and myself I desire to thank you for your very fair treatment and prompt settlement."

Canada's New Ships.

The contract for the Canadian fast Atlantic service has finally been signed with Peterson, Tate & Co. of New Castle, England, and the work of building the steamers will now progress as rapidly as possible.

The vessels are required to be of 10,000 tons register and to maintain an average speed of 500 nautical miles a day, or 21 knots. Their length is to be 520 feet, and they are to be equal in every respect to the best steamers afloat, such as the Campania and Lucania. Each vessel must accommodate 300 first-class, 200 second-class, and 800 steerage passengers, and must possess a cargo accomodation of 1,500 to 2,000 tons, of which at least 500 tons must be cold storage. The fleet is to consist of four steamships, of which two are to be ready by May 31, 1899, and the other two by May, 1900. The service will be fortnightly while there are only two steamers, and weekly when all four are ready. The steamers will start from Liverpool and run in summer to Quebec and to Montreal when the navigation permits; in winter they will run to Halifax, Nova Scotia, or St. John, New Brunswick, at the option of the contractors, such option to be declared before May 31, 1899, the date fixed for the commencement of the service. The British government has stipulated that the vessels are to call at an Irish port if required, and that condition has been accepted by the contractors. The contract is for a term of ten years, and the contracting firm will receive a subsidy of $772,500 of which the British government will pay one-third and the Canadian government two-thirds. The firm is not allowed to accept any other subsidy. If it does, the amount will be deducted from the British subsidy. There must be no discrimination against any Canadian railway. The contractors are to deposit $50,000 cash and to give a guarantee for another $50,000. The vessels are not allowed to call at any foreign port.

The Marine Review has prepared in neat oak frames cards containing the schedule of time required to be run between certain points in the St. Mary's river under the speed limit of seven miles an hour. When hung in a pilot house, distance and time may be readily noted from these cards, as the type is large. They will be sent by express to any address at $1 each, or may be had upon application at 409 Perry-Payne building, Cleveland, for 65 cents each.

The Other Side of the Roby-Florida Collision.

The propeller George W. Roby, which was libeled by the owners of the steamer Florida for something more than $172,000.00 damages, was appraised at Detroit Monday in proceedings for limitation of liability for $60,000.00. The answer of the Roby, which was filed at the same time by Mr. Goulder, gives the following version of the collision:

That on said 20th day of May, A. D. 1897, the said propeller George W. Roby was bound up Lake Huron for Detour Passage on a voyage to Lake Superior, having in tow upon a long line the schooner William D. Becker; both vessels were without cargo. At and before the time of collision a dense fog prevailed, and from the time the fog set in the Roby and Becker made fog signals on the steam whistle and bell in all respects as required by law. When several miles below Presque Isle the Roby was well out from the land, steering N. W. by N. ¼ N., slightly outside of the regular course. The whistle of a steamer, which proved to be the Florida, was heard on the port bow exchanging two blast signals with another steamer bound up the lake. The engine of the Roby was thereupon checked, and thereafter, until stopped and reversed as hereinafter shown, the Roby proceeded under slow check. While so proceeding and while the Florida was still a long distance away, the master of the Roby, who was on top of the pilot house in charge, blew to the Florida then on his port bow a long single blast of the whistle. He received no direct answer but heard the fog signal of the Florida. After a proper interval the Roby again blew a long single blast. Receiving no response whatever, she then blew an alarm signal of several short whistles blown in rapid succession and stopped her engine, when the Florida, still on the port bow, blew two short blasts. The apparent distance and direction of the signal and its character indicated that the Florida was inside and to port of the Roby, approachng on a crossing course, and, having the Roby on her own starboard side, intended to keep clear by passing outside ahead of the Roby. The Roby's helm was put hard astarboard, she answered with two quick toots and backed strong and continued backing until the collision; the effect of the helm and the light wind causing the Roby's bow to fall off to port as she lost headway. While the Roby was so backing the Florida again blew two short blasts of her deck whistle and a long whistle and came in sight through the fog about a length away, standing across the Roby's bow; she came at rapid speed, carrying a bone in her teeth, her starboard quarter swinging down fast toward the Roby as if she were under hard astarboard helm; someone in her pilot house singing out hard astarboard; and having failed to make sufficient allowance to clear the Roby by going outside ahead of her or to take any timely measure to avoid collision she threw herself at full speed so close across the bows of the Roby that she was struck abaft of amidships on her starboard side, the weight and remaining headway of the Roby, aided by the swing and momentum of the Florida, causing the sharp stem of the Roby to cut so deeply into the Florida's side that she began to fill and settle. The engines of both vessels were stopped; the Roby then went ahead, overtook the Florida and made fast to her port side. The crew, except some men who left in a boat and were subsequently picked up, were taken on board the Roby, and in a short time the Florida went down.

This statement differs widely from that of the libel filed by the Florida. Which is the correct one remains for the determination of the court.

Liability of an Owner, and Vessel.

Judge Grosscup, of the Northern District of Illinois, recently held that a city is liable for a collision between its fire tug and another vessel, when the collision results from the negligence of the tug. It was urged in defense by the city that notwithstanding its servants in the handling of the fire tug were blind and thoughtless in their haste to reach a fire and their negligence was such that if the tug had been engaged in a private enterprise there would have been no doubt of her liability, nevertheless, the tug being engaged in a public duty, it and the city as well, were exempt from liability for her negligence while so engaged.

This decision accentuates the marked difference between the liability of a master for the acts of his servants and agents ordinarily, and the liability of an owner for the acts of his vessel. In the first instance, to charge the master with liability, the relation of principal and agent must exist and the wrong complained of have been done by the agent or servant within the scope of his agency or service. In the second instance, the vessel itself is held to be the offender, and the owner is liable to the extent of his interest in the vessel by reason of his ownership alone and not that he stands in the relation of principal, and indeed, it is immaterial whether at the time of the commission of the offense his property is in control of officers and crew appointed by himself or not, the ship "in contemplation of the maritime law" including the crew as well as the machinery, &c.

The court says: "A firm grasp of this principle of maritime law clears this case of its difficulties. At common law the city is not liable for the negligent acts of its fire department, for the reason that the fire department are not the servants of the city in its corporate capacity. The negligence of the firemen, therefore, is not attributable to the city. But in the case under consideration the injury done by the vessel, including its crew, to the libelant, is chargeable to the owner, by virtue of the mere fact of ownership, and can be collected, directly, by seizure of the vessel, or, indirectly, by a suit in personam. In either case the liability rests, not in the relation of principal and agent, or master and servant, but in the bare fact of ownership."

Considerations of public policy prohibit the seizing of such a vessel as a fire tug, even temporarily, but the city's immunity does not extend beyond that and she may be made to respond by an action in personam. A similar case is now pending in the United States Supreme Court on certificate from the Circuit Court of Appeals for the second circuit.

The Circuit Court of Appeals, Chicago, decided an important case on Saturday last. On the night of the 19th of April, 1893, the steamer Sheboygan, laden with a cargo of about 16,000 bushels of corn, was lying in the Chicago river. The steamer City of Naples came in light on the morning of that day, and made fast to the light-house pier. It began to blow from the east, and as the gale increased the schooner pulled around into the slip to the leeward of the steamer. The gale still increased and about midnight the stern lines of the Naples carried away and she drifted down on the schooner and struck her. The engine was then started and the helm put hard-a-starboard and she was kept away from the schooner until the wheel chains broke when the Naples again drifted down on the Sheboygan and with her wheel cut holes into her side so that she filled and sank, and vessel and cargo became practically a total loss.

The case was tried before Judge Grosscup who pronouncd it an inevitable accident, and this decision was affirmed in the court of appeals. Mr. W. H. Condon and Mr. H. D. Goulder appeared for the schooner and cargo, and Mr. C. E. Kremer for the City of Naples.

Notices to Mariners.

The Michigan Wreckage and Salvage Company, of Detroit, have completed the work of removing the sunken wreck of the schooner Adams by blowing it to pieces, and claim to have left 25 feet of water over her remains.

The protracted rains of the last three weeks have raised the level of Portage Lake three inches, and the water is now higher by six inches than last fall. This allows heavier cargoes for Portage Lake ports than ever before.

The Cleveland Hydrographic office has received the following from Capt. John Wulke of the steamer Tioga: "On June 12, at 3:10 p.m., 21 miles S.S.E. from Thunder Bay island, the steamer Tioga passed a hand pile-driver built on a raft of logs about 8 feet wide, 14 feet long, and 16 feet high. The pile driver was adrift and directly in the path of passing steamers."

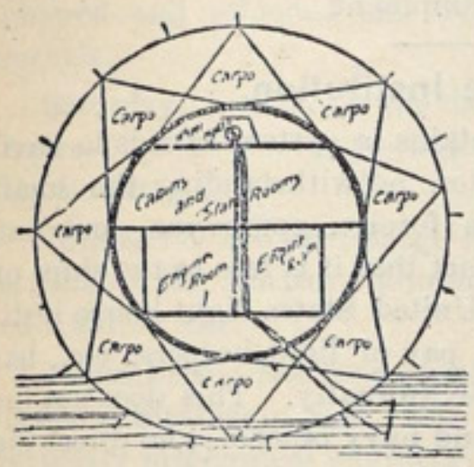
In a letter to Geo. L. McCurdy, Chicago, Capt. C. G. Ennes of the steamer Fairbairn complains regarding the Conneaut harbor entrance as follows: "I think that every master who has to go into Conneaut harbor will say that the government ought not to leave an old sunken crib or a piece of the old pier in the middle of the mouth of the harbor when it could be removed with small expense. It is a bad obstruction, and there will be lots of damage done as it obstructs one-half of a good harbor. If there is any sea at all, you dare not enter on account of it."

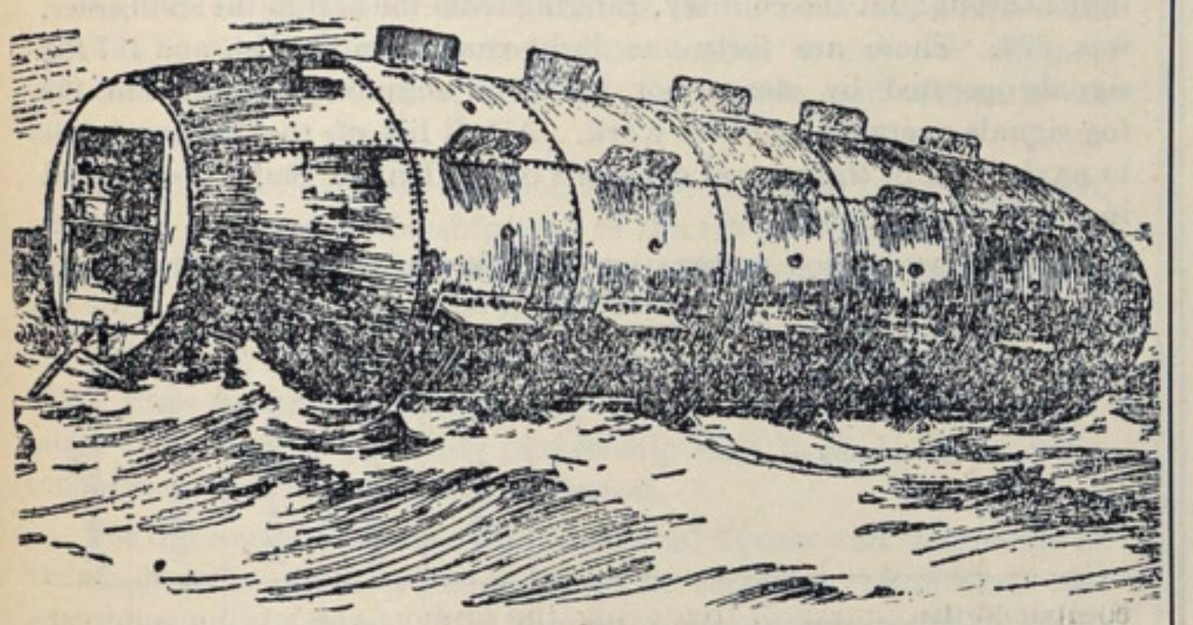
Reservations are now being made for berths at 189 Superior street, 534 Pearl street, or depots, for the Niagara Falls excursion of June 19 via the Nickel Plate road. Special train leaves at 10:30 p. m. $3.50 for the round trip. 109 Jun 17

One fare to Erie, Pa., June 23 and 24, via Nickel Plate road, account Knights of St. John conclave. 132

Another Roller Boat.

At the Polson Iron Works, Toronto, Ont., $10,000 is being expended in the construction of another "marine wonder," designed by a lawyer named F. A. Knapp, who proposes to cross the Atlantic in forty-eight hours. George Goodwin of Ottawa, a wealthy government contractor, is providing money for the construction of an experimental vessel according to Mr. Knapp's plans The vessel consists of three gigantic steel cylinders, the outer one being 110 feet in length by 20 feet in diameter. Within this is another cylinder of the same length, but only 12 feet in diameter. These two cylinders are to be strongly braced together to form a gigantic paddle wheel. On the outside cylinder paddles will be placed as in a paddle wheel of ordinary dimensions. The third cylinder will be placed within the other two, and will be but a few inches smaller than the second one. The intention is that ball bearings shall be placed between the second and third cylinders, and the two outside ones be made to revolve at a high rate of speed by means of engines of 150-horse-power, placed within the third, which will remain stationary. The boat will therefore be virtually a huge paddle wheel rolling over the water instead of through it, with the passengers, engines and steering apparatus in the center of the wheel. The steering gear will consist of steel plates, on the tee-board principle, that will be suspended by chains from either end. The





power from the engines will be communicated to the outer cylinders by means of friction. The inside cylinder will be open at both ends, and the revolving portion of the vessel will slope upward from the water line, thus obviating any danger of shipping seas. The boat will draw not more than a foot or a foot and a half of water. It is expected to have her ready for trial on Lake Ontario in August. Dimensions of the proposed Atlantic steamer, of which this first boat is only an example, are 750 feet length and 150 feet diameter.

Demand for a Fixed Stage of Water.

Editor Marine Review:—I beg to express my appreciation of the high compliment bestowed in your issue of June 10. The ability and care with which the Marine Review is always edited give great weight to opinions and endorsements published in its columns. The point raised relative to the desirability of having a fixed stage of water for the lake waterways is an important one, and should command the careful consideration of every one interested in lake transportation. The amount of freight which can be handled in one season depends largely on the depth of water in the connecting waterways. With low water and active demand for raw material the demand for vessels always produces a rapid increase in the lake tonnage which, during periods of high water and depressed markets becomes greater than necessary to carry the lake freight and results in the cutting of rates. The annual increasing of the channel depths has a tendency to produce a similar effect where such increase of carrying capacity of the lake fleet exceeds the natural growth of the lake traffic. In the past the rapid growth of lake commerce has been so great that this has not been noticeable, but in the future it may become important. It therefore is very essential that the depths which are to be secured for our lake waterways and harbor channels shall be definitely settled as soon as possible, and plans formulated by which such depths when secured may be maintained nearly constant. Geo. Y. Wisner.

Detroit, Mich., June 12, 1897.

Effect of Low Freights on the Lumber Industry.

In sympathy with low range of carrying charges in all other lines, lumber freights on the lakes are now down to a basis of $1.50 a thousand from the head of Lake Superior to Buffalo and Chicago. This is the lowest rate ever recorded. It may be well to note also that handling charges, amounting to 50 to 65 cents are included in this rate, so that the vessel is really paid less than $1.00.

Not long ago a rate of $1.50 from Manistee and Menominee on Lake Michigan to Chicago was not looked upon as a high rate. Thus lumber can be moved from the head of the lakes to Chicago, 900 miles, for the same figure that was formerly charged from Manistee or Menominee, and only 40 cents more than the present rate from those points. Lumber can be carried to Buffalo, about 1,000 miles from Duluth, at the same rate charged to Chicago, 900 miles. With rates nearly even all up and down the lakes, mills on Lake Michigan have so little advantage over those on Lake Superior in respect to cost of freighting that the item is not important as a market factor. The Northwestern Lumberman, commenting on this condition, says:

"It can be plainly seen that the leveling tendency in lumber freight rates on the great lakes has had the effect to also induce a lower level of prices; for the minimum must govern. The producer of lumber on Lake Michigan can now get no more for his lumber than the mill operator at the extreme end of Lake Superior. True he does not have to pay quite as much to freight his product to the Chicago or Buffalo market, but this is more than offset by the cheaper stumpage of the further northwest. Practically the Duluth-Superior or Chequamegon bay mill operators are as well situated with reference to the markets as are the mill towns on Lake Michigan. It looks as if this should have the effect to even up the value of stumpage between the two sections. On Lake Superior mill operators are this season experiencing a severe competition from Canadian lumber in the Tonawanda and Buffalo markets, in spite of the low freight rates at which they can deliver product at Lake Erie points."

Insurance Company's Capital Impaired.

A dispatch from Albany announces that the capital of the Norwood Fire Insurance Co. of New York has been impaired. This company took quite a line of lake insurance, both hull and cargo, last spring, through one of the old general agencies, but it is understood from some Cleveland vessel owners that in most cases this insurance was transferred recently to other companies. The Albany dispatch says:

"Supt. Payn of the state insurance department has made public the report of Chief-Examiner Isaac Vanderpoel, giving the result of his examination of the Norwood company and showing its condition on April 30. The report says that the assets are $488,691, which includes stocks and bonds valued at $348,602; cash on hand, $22,428; premiums in course of collection, $66,777; bills receivable, not matured, taken for premiums, $50,882. The liabilities, including the capital stock of $200,000, are $621,986. The amount of unpaid losses and claims is $84,792, and of unearned premiums $299,965. The examiner's report shows an impairment of capital amounting to $133,-294. Since the date of examination the impairment has been reduced to $52,438, by a reinsurance of the greater portion of the company's business in the Providence-Washington Insurance Co. of Providence, R. I. Under the provisions of the insurance law, where an impairment of capital exceeds 25 per cent. or, as in this case, $50,000, Supt. Payn must issue a requisition requiring the stockholders to make good an impairment of capital. If the impairment is not made good, the superintendent is compelled to report the company to the attorney general as insolvent, with a request that action be taken to wind up its affairs."

An artistic brochure entitled "Summer Outings" is published by the Nickel Plate road, describing vacation resorts along that line. Address B. F. Horner, general passenger agent, Cleveland, O., for a copy. 55 Jul 15

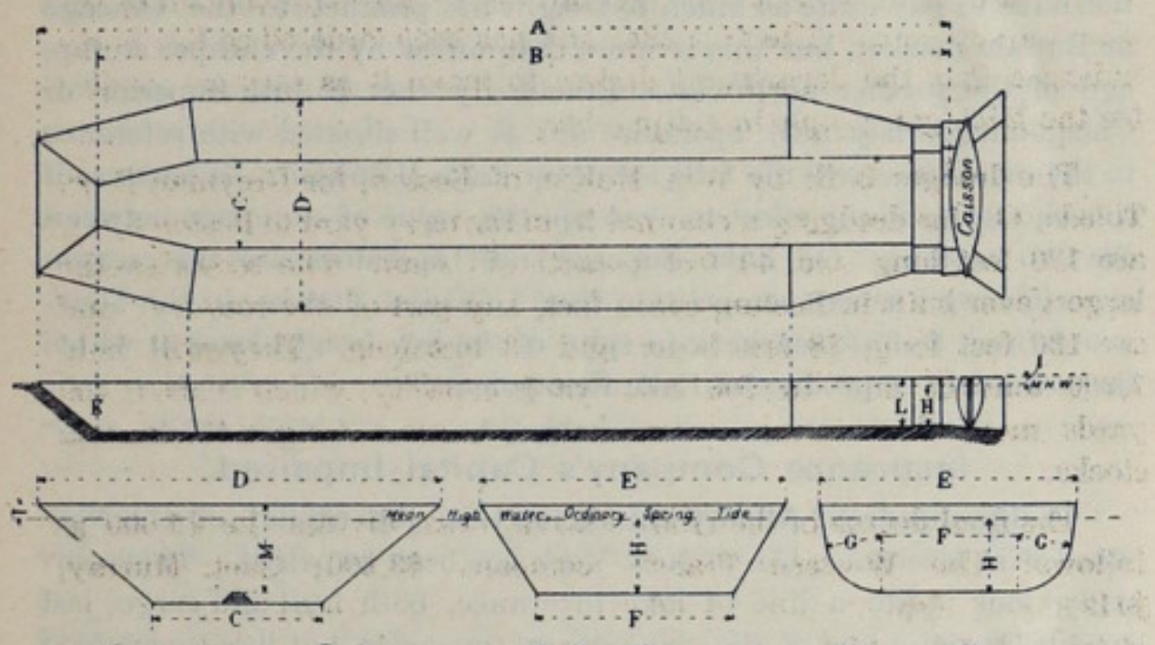
One fare excursions via the Nickel Plate road July 3rd, 4th and 5th. Ask agents. 138—4

The St. Lawrence Route.

The improvements to the St. Lawrence canals that are rapidly being pushed by the Canadian government, may when completed, open up a channel for transportation that will divert a surprising volume of the export business. With the present condition of channels Montreal is the meeting place of the inland and ocean traffic that goes via the St. Lawrence. From a recent report of the Montreal harbor master it is learned that the arrival of inland vessels has been decreasing. In 1894 the inland arrivals numbered 933; 1895, 780; 1896, 848 and 1897, 825, the years including the previous season from June 1. The arrivals of sea-going vessels indicate a slight increase in the ocean commerce. They are as follows. 1894, 122 vessels with a tonnage of 194,501; 1895, 91 vessels of 154,007 tons; 1896 111 vessels, tonnage 190,654; 1897, including year pervious to June 1, 113 vessels, tonnage 196,208. This makes an arrival of an ocean-going vessel for almost every day of the season of open navigation. This is a small commerce but the disadvantages are great. Lake vessels of moderate size discharge their cargoes at Lake Ontario ports and they are transferred to small river barges that are small enough for the canal locks. When the same lake vessels that can pass the Welland canal locks can go down to Montreal and Quebec they certainly will increase this commerce very largely. With the completion of improvements now under way and scheduled for the next two or three years this will be possible.

Dimensions of Dry Docks.

The diagram with explanations shows particulars of manner of measuring and giving dimensions of United States government docks. While such technicalties are not necessary for giving dimensions of



A	Length over all	G	Radii of Invert
B	" on floor	H	Depth of Water over Sill { Mean High Water / Ordinary Spring Tide
C	Width " "	I	Coping to Mean High Water
D	" " coping	K	" " Floor at Head
E	" of Entrance on coping	L	" " " " Inner Abutment
F	" " " " floor	M	" " Keel Blocks

lake docks, it would be well if some uniform plan was followed for giving sizes of them, and this may be the means of causing the dry-dock association on the lakes to give the matter attention.

In General.

If the wrecking company which has discovered the long-lost steamer Pewabic is successful with its new diving apparatus in raising her, it is said that a contract will be closed with the North German Lloyd to recover the ocean steamer Elbe and its treasure of $500,000 in gold. The Elbe lies in 150 feet of water. She was sunk in a collision in the North Sea on the night of January 30, 1895, and 300 lives were lost.

Plans for the new Pacific Mail steamer to run between San Francisco, Japan and China are said to have been adopted and it is understood that the vessel will be built by the Newport News Ship Building & Dry Dock Co. of Newport News, Va. The vessel will be on the pattern, as far as regards build and machinery, of the swift steamers of the Atlantic lines, Majestic, Teutonic, etc., but her interior decoration will be of a simpler character, the proposed cost of construction being $1,250,000, as against $1,800,000, which was the cost of the Majestic. The new boat is to have an average speed of 17 knots, and is to be delivered by about the month of May, 1898.

Capt. J. F. Vaughn of the steamer Northern Queen proposes a remedy for the difficulty at Sailors' Encampment, Sault river, where a thickly wooded point on the island is the cause of great anxiety among captains, on account of the general fear of collision. In a letter to Geo. L. McCurdy of Chicago, he says: "I would suggest that a pole and platform be erected just above the encampment and an attendant provided with flag and lantern. The flag could be run up by day and the light by night, whenever it would be necessary to warn an up-bound boat to stop so as to admit of safe passage in the cut." Capt. Vaughn's suggestion is all right, and will be submitted to the light-house authorities, but it is unfortunate that the light-house board has no fund that could be used for a service of this kind. Suggestions of this kind may eventually result, however, in some method of overcoming the difficulty at the encampment.

U. S. Light-House Institution.

No government in the world maintains a system of aids to navigation equal to that of the United States, notwithstanding the small number of American vessels engaged in foreign commerce, and one great advantage of this service is the fact that it is free to the ships of all nations. The expenditures of the United States light-house institution for maintenance of light-houses, pay of light-keepers, etc., has reached an aggregate of full $3,000,000 annually. This does not include the salaries of some forty army and navy officers who direct the affairs of the institution, and has no reference whatever to expenditures of $500,000 to $1,000,000 annually for new light-houses, fog signal stations, etc.

On June 30, 1896, the number of aids to navigation of all kinds in this country was 8,518, of which 5,341 were on the Atlantic coast, 671 on the Pacific coast, 1,087 on the great lakes and 1,419 on western rivers. Those on the rivers were mainly tubular lanterns, and were, of course, comparatively inexpensive. The numberr of important lights throughout the country, ranging from the first to the sixth order, was 672. There are forty-one light-vessels in the list, and 137 fog signals operated by steam, hot air or oil engines, in addition to 193 fog signals operated by clock work. A full list of the different aids to navigation in the several divisions of the United States is contained in the following table:

AIDS TO NAVIGATION MAINTAINED BY UNITED STATES LIGHT-HOUSE INSTITUTION.

DESCRIPTION OF AIDS.	Atlantic coast.	Pacific coast.	Lake coast.	Western rivers.	Total entire coast, 1896.
Electric lights	4	.....	.....	.....	4
First-order lights	41	18	.....	.....	59
Second-order lights	15	1	3	.....	19
Third order lights	29	4	22	.....	55
Three-and-a-half-order lights	3	.....	7	.....	10
Fourth-order lights	156	18	92	.....	266
Fifth-order lights	106	7	38	.....	151
Sixth-order lights	51	.....	61	.....	112
Lens lanterns	68	16	61	.....	145
Range lenses	16	.....	.....	.....	16
Reflectors	44	.....	3	.....	47
Tubular and other lanterns	343	93	122	1,414	1,972
Light-vessels in position	29	1	11	.....	41
Electric-lighted buoys	10	.....	.....	.....	10
Gas-lighted buoys	15	.....	3	.....	18
Total lighted aids	930	158	423	1,414	2,925
Fog signals operated by steam, hot air or oil engines	52	26	59	.....	137
Fog signals operated by clockwork	165	12	16	.....	193
Day beacons	327	88	2	5	422
Whistling buoys	50	20	.....	.....	70
Bell buoys	93	11	2	.....	106
Other buoys	3,724	356	585	.....	4,665
Total unlighted aids	4,411	513	664	5	5,593
Total aids of all kinds	5,341	671	1,087	1,419	8,518

An excellent chart of Green bay and approaches, on a large scale has just been published by the United States hydrographic office and may be had from the Marine Review. The chart is corrected to March 1, 1897, and takes in, with Green bay, the west shore of Lake Michigan from Manistique to Kewaunee. It will be of great value to masters of Lake Michigan trading vessels, as well as the men in charge of the larger ore and coal carriers trading to Escanaba. Soundings are in feet and there is a scale of statute miles attached. The price is $1.25, but the chart is so complete in detail that it is larger than the single sheet charts of either Lake Superior or Lake Michigan.

Around the Lakes.

The two boilers for fog signals at Galoup islands were built by the Kingsford Iron Works, Oswego, N. Y.

A few days ago Boutelle's tug Traveler landed a raft of logs scaling 4,500,000 feet at Bay City from Spanish river, Ont.

The arrivals at Milwaukee during the week of June 7 consisted of 122 steamers and 32 schooners, the largest week's business for several years.

Notwithstanding the Inter-Ocean was aground and her cargo was lightered and reloaded she over-ran her corn cargo one hundred brushels.

Saturday, June 17, is the date fixed for the launch of the steamer Empire City (400-foot type) building at the works of the Cleveland Ship Building Co.

Tonnage of the steel barge Antrim is 3,200.49 gross and 2,902.76 net; that of the Amazon; another of the large barges is 3,599.09 gross and 3,331.55 net.

James Brodie has been appointed marine superintendent for the Northern Steamship line, with headquarters at Buffalo. He was previously mechanical engineer, with headquarters at Duluth.

The owners of the Waldo Avery won their suit against the city of Cleveland for damages caused by the draw of the Seneca street bridge swinging into the steamer. Amount asked was $3,579.18.

Knapp & Gillen, contractors for the $200,000 Milwaukee breakwater extension will build a wharf on the piers on which they will construct sixteen cribs, saving launching and towing them to the place of sinking.

Duluth shipped over 40,000 tons of ore in 24 hours. This is believed to be the greatest amount of ore loaded at any ore shipping port in a day. Shipments at Ashland, Marquette and Escanaba are much less than last year.

Capt. Frank Rice will command the new Corrigan barge Polynesia, which was launched at the ship yard of the Globe company on Saturday last. This vessel is 376 feet keel, 46 feet beam and 26 feet deep. She will tow with the steamer Italia.

Capt. M. W. Humphrey, for many years master on the lakes and of late years stockholder and manager of the Sulphite Fiber Transportation Co's fleet, has gone into partnership with M. F. U. Potts in the commission brokerage business at Detroit.

The discrepancy between Soo canal coal figures and statements of Duluth docks is said to be due to errors in reporting bituminous coal as anthracite at the canal. The intimation that anthracite and bituminous are too technical for some lake captains is laughable.

Capt. Peter Batchelder will be tried at the January session of the United States district court in Milwaukee for endangering the government property by maintaining too great a speed while passing through the Sturgeon bay ship canal with the tug Sidney Smith and tow.

F. A. Kirby of Wyandotte has figured out that the fleet controlled by the Rockefeller interests, including persumably the whaleback fleet, has capacity for only about 8 per cent. of the ore carried in a season, figuring on the basis of the amount brought down during the past few years.

The North West and North Land have commenced their semi-weekly service between Buffalo and Duluth. The former has been given the title of the King of the Lakes and the latter the Queen of the Lakes. They afford a royal service irrespective of the titles, and their rates have been materially reduced.

The Rockefeller steamer James Watt came within a hundred tons of breaking the Lake Superior ore cargo record by loading 4,910 gross tons of ore at Duluth and delivering it at Conneaut. She had on150 tons fuel and her draft forward was 15 feet 9½ inches and aft 16 feet 7 inches.

A. R. Sinclair & Co., Duluth, bought from the Duluth Trust Co. assignee of B. B. Inman, the wrecks of the steamer Winslow and the tug E. T. Carrington for $75. The tug was invoiced at $1,000 and it will cost $1,200 to put it in shape. Nothing but the burned hull remains of the Winslow.

The steamer America appears to have been more injured by the breaking down of her machinery on Lake Huron last Friday than was at first supposed. The piston rod broke and the cylinder was badly wrecked, both ends coming out. An examination was made of her after the Merida brought back to Port Huron. H. G. Trout of Buffalo will rebuild the broken parts and ship them to Port Huron. It will take two or three weeks to do the work.

The telephone cable connecting Leamington with Pelee island, Lake Erie, will be relaid in August, the eastern end taken up and shifted to the east side of Point Pelee bar and extended to the Dummy light, where an instrument will be placed. Thence the cable will extend to Pelee island, south of the middle ground.

William Hingston & Son are building two 675-yard scows at the foot of Genessee street, Buffalo, for Hughes Bros. & Bangs, to be used on the breakwater extension at that point. They have also on the stocks a small dredge for Parker & Co., to be used in canal work at Lockport, and a fish tug for Dunkirk parties.

The Canadian government has issued an order to let no logs leave Canada for the United States without an order direct from the minister of customs at Ottawa. It was expected that some 200,000,000 feet of logs would be towed from Georgian bay to the Saginaw valley this summer, but this order may delay or prohibit shipment.

The old Lake Superior Transit Co. has settled a claim of $1,778 held against it by the Marshall-Wells Hardware Co., of Duluth. It was to recompense the hardware concern for some bar iron which was lost by the burning of the steamer Northerner in 1892. The transit company had delayed shipment until insurance had expired.

Orders were issued by the navy department Tuesday for the cruiser Yantic to go to Boston. Upon her arrival there a board will make a survey as to her condition, and then if everything is all right she will be turned over to the Detroit naval militia by the commandant of the Boston navy yard. The fact that she has been ordered so far north indicates that the department desires to make it as easy as possible for the Michigan people in getting her.

The dredges built by Wm. McKie, of Boston, for Breyman Bros. Toledo, O., for dredging a channel from the navy yard to Boston light, are 120 feet long and 40 feet breadth of beam. The scows are the largest ever built in Boston, or, in fact, any part of the country, and are 130 feet long, 38 feet beam and 13 feet deep. They will hold 1,200 tons of mud in 700 cubic yards capacity, which is about 400 yards more than former scows held. A scow weighs 450 tons on stocks.

The final decree in the Hadley salvage case divides the $5,000 as follows: The Western Transit company $3,500; Capt. Murray, $412.35; E. Roberts, mate, $106.25; P. Dewan, second mate, $79.16; Patrick Welch, chief engineer, $147.61; George Dolan, first assistant engineer, $90.96; W. G. Dirling, steward, $74.11. The oiler, firemen and wheelman, five in number, get $42.40; lookout and watchmen, four in number, $38.05 each; six deck hands, $20.58 each, and a waiter and porter, $30.30 each.

The copy of clearance papers of the sunken steamer Pewabic has been found, and they corroborate Capt. McKay's statement of her cargo. She left Houghton Aug. 7, 1865, having as cargo 48 cakes Isle Royal copper, weighing 7,387 pounds; 41,400 pounds Quincy mine copper in barrels; 9,109 pounds of Hancock mine copper in barrels; 53,600 pounds of Pewabic mine copper in barrels, and 32,200 pounds of Frankiln mine copper in ingots; also a large quantity of Quincy mine material, a total equal approximately to 267 tons of refined copper.

Tugs have been engaged to pull on grappling irons attached to the Pewabic's upper deck, while dynamite is being exploded in her hold, with a view to opening up the hold. This will enable the divers to grapple the barrels and pig copper. The bell or diving apparatus before being tried on the wreck was dropped a distance of 300 feet, with several men inside. It is made to stand the pressure of water at a depth of 1,000 feet and it is really not a bell, but retains the name because the first contrivance was in the form of a bell. This was made in the east, of bronze, but collapsed wher put to use. The one now used was made by the Milwaukee Boiler Works, and would not be distinguished from an ordinary boiler.

The Continental Iron Works, Brooklyn, has under way corrugated furnaces for the two Japanese cruisers that are being built in this country, as well as the furnaces for the Kearsarge and Kentucky and three other battleships being built by the Newport News Co., Wm. Cramp & Sons and the Union Iron Works of San Francisco.

MARINE REVIEW

DEVOTED TO LAKE MARINE AND KINDRED INTERESTS.

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The books of the United States treasury department on June 30, 1896, contained the names of 3,333 vessels, of 1,324,067.58 gross tons register in the lake trade. The number of steam vessels of 1,000 gross tons, and over that amount, on the lakes on June 30, 1896, was 383 and their aggregate gross tonnage 711,034.28; the number of vessels of this class owned in all other parts of the country on the same date was 315 and their tonnage 685,204.55, so that more than half of the best steamships in all the United States are owned on the lakes. The classification of the entire lake fleet on June 30, 1896, was as follows:

	Number.	Gross Tonnage.
Steam vessels	1,792	924,630.51
Sailing vessels and barges	1,125	354,327.60
Canal boats	416	45,109.47
Total	3,333	1,324,067.58

The gross registered tonnage of the vessels built on the lakes during the past six years, according to the reports of the United States commissioner of navigation, is as follows:

Year ending June 30. 1891	204	111,856 45
" " " 1892	169	45,968.98
" " " 1893	175	99,271.24
" " " 1894	106	41,984.61
" " " 1895	93	36,352.70
" " " 1896	117	108,782.38
Total	864	444,216.36

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC. (*From Official Reports of Canal Officers.*)

	St. Mary's Falls Canals.			Suez Canal.		
	1896*	1895*	1894	1896	1895	1894
Number of vessel passages	18,615	17,956	14,491	3,409	3,434	3,352
Tonnage, net registered	17,219,418	16,806,781	13,110,366	8,560,284	8,448,383	8,039,175
Days of navigation	232	231	234	365	365	365

*1895 and 1896 figures include traffic of Canadian canal at Sault Ste. Marie.

Pittsburg has awakened after several years sleep to the fact that she again wants a ship canal to Lake Erie. She thinks that a canal would cure all her natural disadvantages, and uphold her supremacy as an iron-producer. While the ship-canal scheme has been dead or sleeping, Pittsburg's mainspring, Andrew Carnegie, has spent a large amount of money and is going to spend more in perfecting a railway and building connections to it, equipping it with steel dump cars, etc., that will carry all the iron ore his furnaces needs from the lakes to Pittsburg. He has spent money also to perfect an arrangement at his furnace plant for handling ore carried by rail, but if he has built any docks or channels to accommodate the ship-canal, no one has heard of it. Carnegie's railway will carry more ore in a day than the ship-canal would accommodate in a week, even if it were constructed. There is something the matter with Pittsburg and some of her good citizens think that a ship-canal will cure it. But they have not diag nosed the case properly. The trouble is her location. If Pittsburg wants the canal built so she can move herself to the shores of Lake Erie and take ore for her furnaces from the holds of 5,000-ton vessels, then there is some sense in it, but she can never hope to build a canal that will float these 5,000-ton vessels to her. There isn't room in her rivers for one of these lake vessels to turn around.

When Andrew Carnegie gets the price of steel down to where a great export business will demand that he double his capacity, he will locate at some Lake Erie port, of which it has been said he has been seriously thinking.

One of the arguments that Pittsburg papers are using to show the greatness of her harbor, is that in a recent dry spell some 20,000,000 bushels of coal was stuck in the mud for months. They add that this was the greatest amount of freight ever gathered in any harbor in the world. There are some grounds for the claim. It was probably the greatest amount of freight stuck in the mud any place in the world, but that does not entitle it to the name of harbor.

It seems that the canal committee were in debt and a subscription of $7,500 was raised by public spirited citizens. The balance is not to be used to build the canal, but to educate congressmen and others who are in position to take over the privilege of constructing this great work at the expenes of the government. This balance ought to be used to tap a creek or two and run them into the Ohio so that the annual disgrace of having the largest merchant navy in the world lying at anchor in two feet of mud should not recur.

A paragraph of interesting comparisons, based on the big cargo of corn—117,000 bushels or 6,076 net tons—recently moved from Chicago to Buffalo by the steel barge Amazon, has started the rounds of lake papers. This cargo represents the product for an entire year, of not less than 6,000 acres of average land. That means nearly ten square miles. It is equal to all the fields of a hundred good-sized farms. On good roads, where the railroad station to which the corn was drawn was not more than four or five miles away, 200 teams, with farm wagons of the best kind, might draw this quantity of corn to market in ten days. One farmer with one team could not move the Amazon's cargo five miles in less than six years. To make comparisons with greater things, this record load of the lakes would fill ten big freight trains. It would load a line of cars a mile and a half long. Moreover, it would be considered a very heavy cargo for any one of 99 per cent. of the ocean vessels carrying freight between this country and Europe. And in almost any ocean port on the other side of the Atlantic it would take as long to load or unload a ship so burdened as the Amazon will require for getting her cargo at Chicago, carrying it to Buffalo and unloading it there.

For several years the secretary of the navy has had a special flag, which is displayed when he visits a ship or on other special occasions, the penant being intended, of course, to indicate the importance and dignity of the office of secretary. An official flag has also been selected by the secretary of war. An elegant sample of it in silk was exhibited in Washington a few days ago. The field is of red, bordered by gilt fringe. In the centre of the field is an eagle worked in silk by hand, the stitching being done so as to make both sides alike as to color and finish. The eagle is not that usually represented in the national coat of arms, its wings being extended to the full length and width and its general appearance being more offensive than defensive. On the breast of the "bird of freedom" is the American shield, richly and tastefully worked in the traditional colors.

The annual report of James M. Schrank of Philadelphia, general manager of the American Iron &Steel Association, contains as usual complete statistics of the iron and steel industries of the United States. The foreign value of all the iron and steel manufactures imported into the United States during 1896 was $48,670,218, an increase of $13,598,655. During the year the United States made 8,623,127 tons of pig iron, 3,919,906 tons of Bessemer steel ingots, 1,298,700 tons of open hearth steel, and 5,281,689 tons of steel of all kinds, and rolled in all 5,515,841 tons of finished iron and steel, including rails. The output of Connellsville coke aggregated 5,411,602 tons.

Both houses of congress have passed Senator Frye's bill to prevent collisions on harbors, rivers, and inland waters of the United States. This bill brings into accord the inland rules with the international rules which take effect on July 1. Of the thirty-one international rules twenty-seven are applied by this bill to inland waters. Of the thirteen supervisors' rules, eight, including the most important concerning responsive whistles, are retained. The bill will take effect four months after its approval. It is understood, of course, that this law does not relate in any way to lake navigation, which is governed by the White law.

It was largely through the efforts of Capt. Alex. McDougall that the Canadian government was induced to hurry the work of providing 14-feet navigation through the St. Lawrence canals. Dredging in the shallow parts of the St. Lawrence system is being carried out on a big scale, and there is a renewal of the assurance from government officials that the deeper St. Lawrence waterway will be completed by the spring of 1898.

Every patriotic American would be glad to see the return of the day when American ships, built by American mechanics, manned by American seamen and floating the American flag, would once more be a recognized factor in the ocean-carrying trade, and the present congress will make a big mistake if action is not taken before adjournment on some measure of assistance for American shipping.

Ship builders will soon have an opportunity to bid on another vessel for the revenue marine. The sundry civil appropriation bill, which has just been signed by the president, carries an appropriation of $175,000 for a revenue cutter for the Atlantic coast, the vessel to be stationed at New York.

Reid's Progress with the Cayuga.

The marine reporter of the Milwaukee Evening Wisconsin, who seems to keep well informed regarding Capt. James Reid's work on the steamer Cayuga, sunk in 100 feet of water near Skilligallee light, Lake Michigan, expresses the opinion that the craft will be afloat within a very short time, unless weather conditions prevent. This opinion is based on a late dispatch from Harbor Springs. On the 9th inst, Capt. Reid caused three of the steel pontoons attached to the wreck to be filled with air, and they lifted it sufficiently to allow two additional cables to be drawn under and placed in position. Although the dispatch does not so state, the lifting undoubtedly was confined to one end of the hull, and if three pontoons were utilized then the third must have been attached temporarily with this object in view. When Capt. Reid abandoned work last fall he had four cylindrical steel pontoons attached to the Cayuga, two at the bow and two at the stern. During the intervening winter four additional pontoons of the same description were built to take the place of a huge wooden surface pontoon which it was found could not be utilized satisfactcrily in rough water. The wooden pontoon had been placed over the wreck amidship, and in order to substitute the steel pontoons it became necessary to sweep additional chains under the hull. This, according to the dispatch from Harbor Springs, has been accomplished without difficulty, and it will now be an easy matter to attach the four steel cylinders and get them in shape for inflation and an attempt at lifting. The most important feature of the news from Capt. Reid's expedition is the fact that he succeeded in breaking the Cayuga out of the bed of mud in which she lies. The suction of this mud was the chief difficulty which confronted him, as it seemed as if the wreck must come to the surface with a jump once the resistance had been overcome. However, by lifting first at one end until it is clear, then amidship and next at the other end, he will have no difficulty in raising the hull to any height desired provided the lifting power of the inflated pontoons and water bottom is adequate. Capt. Reid's plan is to lift the Cayuga from the bottom just enough to enable him to tow her into the still waters of Little Traverse bay at Harbor Springs and then bring her to the surface leisurely. As the Cayuga lies on her side there is every probability that the inflation of the water bottom will cause her to turn bottom up, but Capt. Reid has figured on this result and says it will be an easy matter to put the vessel on an even keel once she has been towed into still water."

New Method of Trial for War Vessels.

A new method of trial was pursued in the case of the United States gunboat Newport, recently completed by the Bath Iron Works of Bath, Me. With the old method in this country of testing the speed of naval vessels, as quite generally understood, a course was marked out in some favorable place by means of stake boats. The course was of sufficient length to give the vessel to be tried a run of four hours at maximum speed. This made the course a very long one. The stake boats were placed at stated intervals along the course. In each boat officials were stationed to take observations of the wind and tide and other conditions affecting speed at the time of the passing of the craft on trial. On board the vessel itself the time of passing each stake boat was taken, and from the time consumed in running over the course the average speed of the craft was reckoned. Then corrections had to be made according to the observations taken in the different stake boats. This process occupied the inspection board about three days. Finally the speed of the vessel was determined with a greater or less degree of accuracy. The expense of this method of trial was very great. In the case of the Bath Iron Works, the vessel to be tried had to be provisioned for a week or ten days, no light expense when it is considered that the ship's company usually reached the number of seventy-five or one hundred persons. The vessel had to steam to New London and back besides steaming at its highest speed over a course sixty miles long or more, usually more.

The method tried for the first time with the Newport is said to greatly simplify matters. The vessel runs over a mile course in each direction at its highest speed. The number of turns per minute of the propeller and the elapsed time is taken during each spin over the mile. The time elapsed during the run over the mile in one direction is added to that of the run in the opposite direction and the result divided by two, giving the speed of the vessel with all influences of wind, tide or other prevailing conditions eliminated. Then the engine is slowed down a given number of turns per minute and another round trip is again made. The round trip is again made several times, the speed being reduced each time. From the data thus obtained, namely the number of revolutions of the screw producing the various rates of speed, a mathematical curve (readily understood by those familiar with analytic geometry) is plotted showing accuratly the speed to be attained by the vessel for any given rate of revolution of the propeller. This having been ascertained, the vessel puts to sea and steams four hours at her highest speed, and all that is necessary to ascertain that speed is to keep a record of the rate of revolutions of the propeller during the run. This known, the speed of the vessel can be easily and accurately reckoned within ten minutes after the trial is over. A trial of this sort occupies but one day, and in the case of the Newport it is said to have proven entirely satisfactory. The Newport made a little better than 12 knots for four hours.

Why the Eddys took Names from Maine.

A Detroit correspondent, writing to the Journal of Lewiston, Me., about lake commerce and the great number of Indian names selected for lake ships, tells why the Eddy brothers, lumber merchants and vessel owners of Bay City, Mich., thought of the state of Maine when christening some of their largest lake vessels. He says:

"That there should be a Penobscot and a City of Bangor thousands of miles from any locality from which they could possibly be consistently named is something a matter of wonder, although easily explained. The selection of these names for the Queen of the Lakes, as the former craft was called when she was launched, and her twin, was a handsome tribute paid their native city and county by the owners, the Eddys of Bay City, Mich., of the firm of Eddy Bros. & Co., and owners in part of the Eddy-Shaw line of lake freighters of which the two boats mentioned are among the newest and largest. The Eddy brothers were born in Milford on the Penobscot and lived for some time in Bangor before taking Horace Greeley's famous 'tip' to young men and turning westward. They transplanted an honored name from the banks of the Penobscot and the city of Bangor to the sandy shores of Lake Huron and Bay City. The name of Eddy is honored in Michigan as it is in Maine, a synonym of push, enterpirse, business sagacity and Indian grit, for the Eddys claim to have the blood of the aboriginal Penobscots in their veins. Maine men are nothing if not patriotic. They are never ashamed of their state. They can boast with all the Yankee pride in the sons of Maine that have made chapters of the nation's history. With the Eddy brothers the building of these fine ships marked an era in their prosperity. When the matter of a name came up they sought to honor the region of their birth, and Penobscot is carried to all ports of the great lakes on one of the proudest prows that ploughs the blue waters of these inland seas. When, a few years later, the second new steamer was pushed overboard again the Eddys turned their thoughts eastward and christened her City of Bangor."

Work on the Deep Channel Project.

The condition of the proposed 20-foot channel from Duluth and Chicago to Buffalo is shown in a report for the month of May by Col. G. J. Lydecker, engineer in charge.

On section 3, which comprises the work in the Sault river at the Sailors' Encampment, the west half of channel has been completed and the buoys changed. June 1, the contractor commenced on the east half.

On section 7, consisting of the Grosse point channel, the contract was closed June 1, affording a channel of 800 feet wide, over 1,800 feet long and 20 feet deep, according to the zero mark on Grosse point range. This gives about 19 feet through Lake St. Clair.

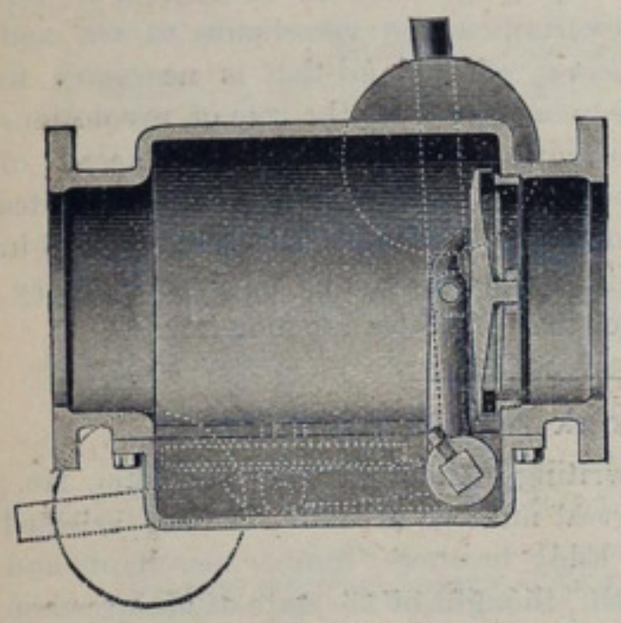
On section 8 work has been resumed between the Bar point light vessel and the light-house.

In the Detroit river work from May 1 to 18 was confined to that part of the channel at present used by vessels from Ballard's reef to the south end of Bois Blanc island. Over this stretch a clear depth of 18 feet was obtained. After the 18th work was confined to Ballard's reef on a strip of 150 feet wide, east of and adjacent to the center line of the channel. Within this area twelve large boulders were found, which it was impossible to remove with appliances at hand. Over these boulders there is a depth of from 16 1-2 to 17.8 feet.

4th of July excursions, July 3rd, 4th and 5th, at one fare via the Nickel Plate road. 139—4

Back Pressure Valve.

Among specialties recently taken up by Jenkins Bros., manufacturers of packing and valves of 71 John street, New York, is a back pressure valve known as the Excelsior, which is described in a neat catalogue for 1897, just issued by that firm. It is described as an improvement in every way over the old form and as an improvement also, in many ways, over any other back pressure valve now on the market. "The Excelsior valve," says the catalogue description, "is noiseless and free from any complicated attachments, whose office it is to partially prevent noise, but which aim is frequently defeated by complications and want of attention. The area of this valve is equal to that of pipe. It has no dash pots, springs, guides or complicated levers to get out of order. Is simple, reliable and well made. Never sticks, and can be relied upon at all times when using exhaust steam for heating; or when used as a relief, or free exhaust on a condensing plant, it has no equal. It can be placed in any position, vertical, horizontal or at any angle desired. It is the only valve on the market that allows the valve to be removed entirely from out of the passage of the exhaust without having to take the valve apart. It is the only valve with a flat face insuring almost unlimited longevity. It is the only valve that can be thrown in and out of use in less time than it takes to say it."



Nickel Steel Ship Plates and Propellers.

When the price of nickel steel is reduced it will no doubt be used in ship building, for it possesses properties peculiarly advantageous, especially for propellers. If pressures are to be increasd in the Scotch boiler some other material besides common steel must be used. A paper read before the institution of Naval Architects says that although the addition of nickel increases the cost of steel considerably, it should be borne in mind that the greatly reduced scantling which the alloy admits of, goes far as a set off to cost. Another important property which belongs to nickel steel is its comparative incorrodibility when exposed to the action of sea water. Mr. Beardmore gave the results of his experiments in this direction, which went to show a much higher degree of durability than ordinary steel or iron. This has an important bearing on its value for propellers or for the shell plates of a ship. The author of the paper quoted the results of many other experiments made to test the fatigue which this alloy will endure. Bars of 1½ in. sq. were nicked with a cold chisel and placed on supports 10 in. apart, and a weight of 10 cwt. allowed to drop upon them from a height of 3 ft., the bars being reversed after each blow. The treatment of nickel and carbon steel bars was identical, but the results were widely different. The carbon steel was fractured after 5 blows and broken after 12 blows, while it took 7 blows to fracture and 35 blows to break the nickel steel. As to the price of nickel steel, the addition of nickel increased the price of steel about $15 per ton per unit; thus a steel with 3 per cent. of nickel would cost about $45 per ton more than ordinary steel. This may be prohibitive at present for ordinary ship building, but the time may come when it may be sufficiently reduced in price to be available for ship building as for other constructive purposes.

The Consular Service.

A reform in the consular service of the United States must necessarily precede any movement for the upbuilding of our merchant marine. The shipping interests of the country should, therefore, join hands with the manufacturers who are trying to bring about such a reform. In behalf of the National Association of Manufacturers, Theodore C. Church, president of that organization, has just addressed an important letter to President McKinley. No other agency employed for the extension of our foreign trade is capable of giving the helpful aid which comes from our consular service, even in its present condition. The consular service of the United States has always been a conspicuous objective point for office-seekers, and the long-continued custom of dealing out the offices as rewards for political service rendered to the party in power has been immeasurably detrimental to American commercial interests in foreign countries. The two great evils from which the service has suffered have been the appointment of men lacking in the needful qualifications, and the unnecessary removal of men whose experience has made them competent to discharge with efficiency the duties of their position. The manufacturers of the United States never were so deeply concerned in foreign trade as at the present time. The markets of the world never were so widely open to American manufactured products as they now are. These manufacturers, of whom there are 1,000 in the association represented by Mr. Church, ask that in future the changes in the consular service shall be as few as possible; that removals shall be made only because of demonstrated incapacity; that vacancies shall be filled as far as possible by promotions or transfers; that appointments shall be made solely upon the basis of proper qualification for the positions, and without regard to political service and that only American citizens shall be appointed to any consular offices.

Located on the south shore of Lake Erie, contiguous to the Nickel Plate road, are many country homes that will accommodate summer boarders. Send to B.F. Horner, general passenger agent of the Nickel Plate road at Cleveland, O., and he will forward you a list on receipt of a two cent stamp. 56 Jul 15

B. P. O. E. excursion to Minneapolis via the Nickel Plate road, July 3d and 4th. One fare. 134—4

The Nickel Plate road sells one fare for the round trip tickets July 3 an 4th. Returning to July 6th. 137—4

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UNITED STATES ENGINEER OFFICE, Detroit, Mich., May 23, 1897. VESSEL OWNERS AND MASTERS are cautioned against passing at HIGH SPEED through the improved 20-FOOT CHANNEL IN LAKE ST. CLAIR, as such speed threatens the durability of the improvement and the safety of navigation. It is hoped that this caution may induce owners and masters to co-operate in so reducing speed through this channel that the promulgation of restrictive regulations may not become necessary.

By order of the SECRETARY OF WAR.
G. J. LYDECKER, Lt. Col., Corps of Eng'rs, U. S. A. July 1

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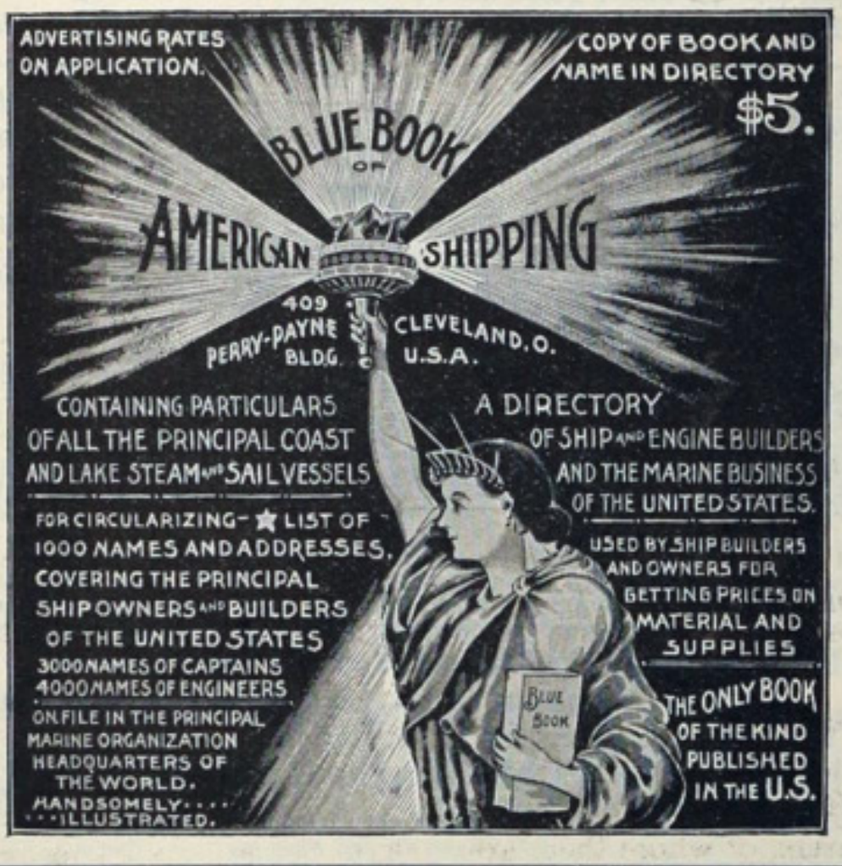
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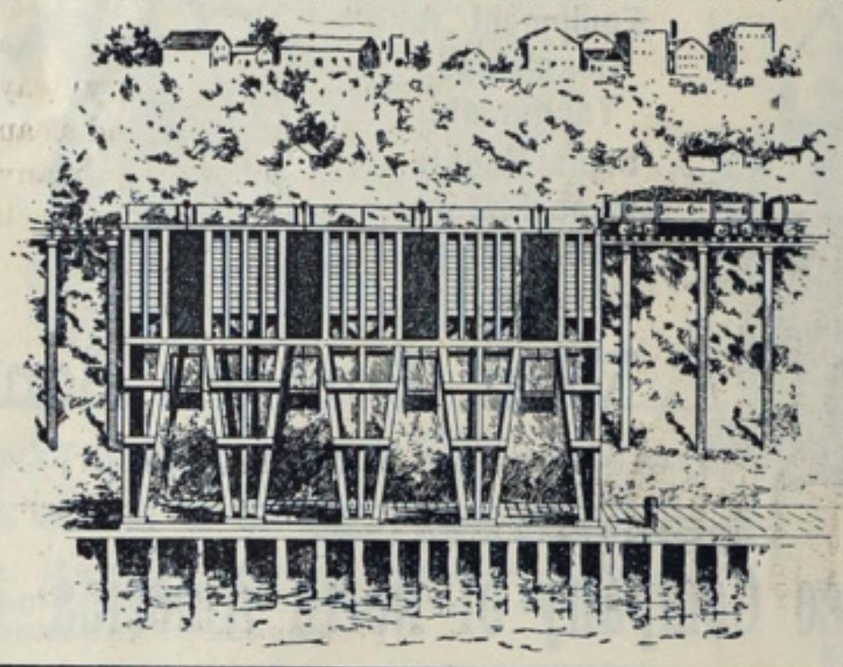

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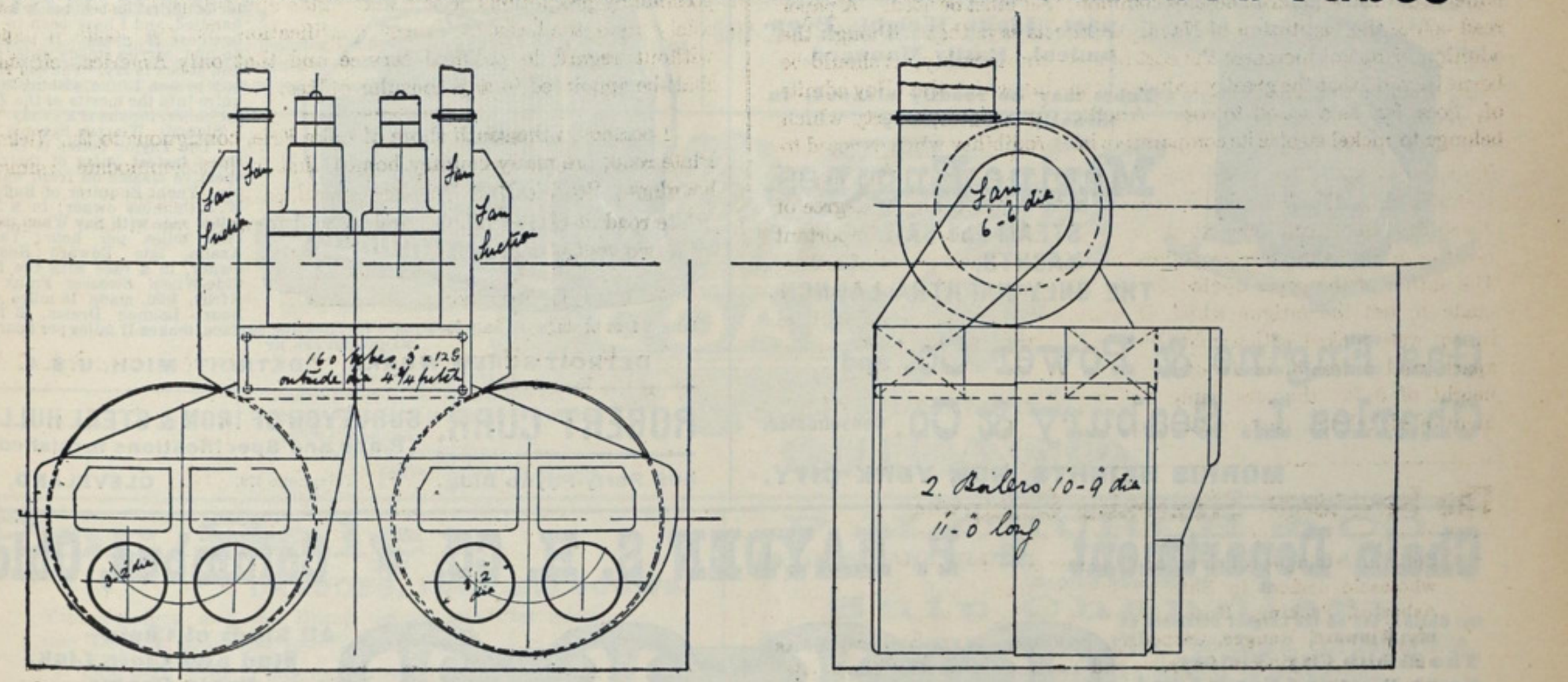

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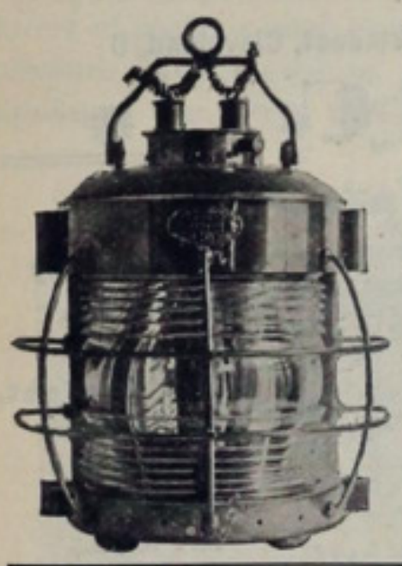

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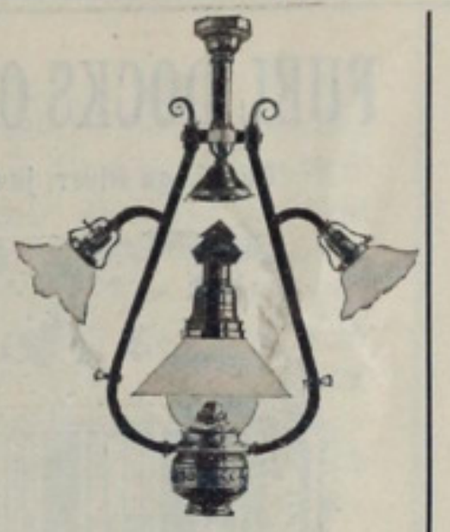

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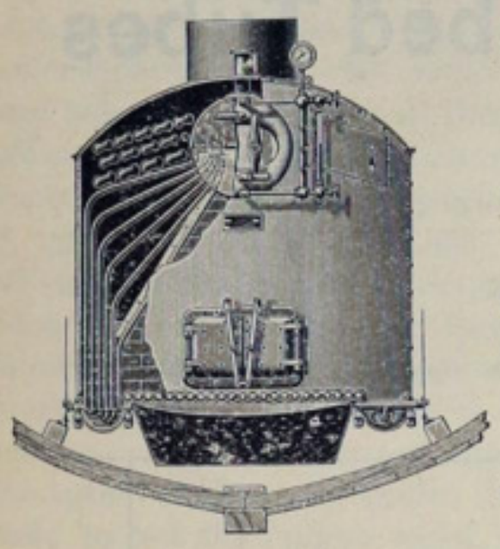

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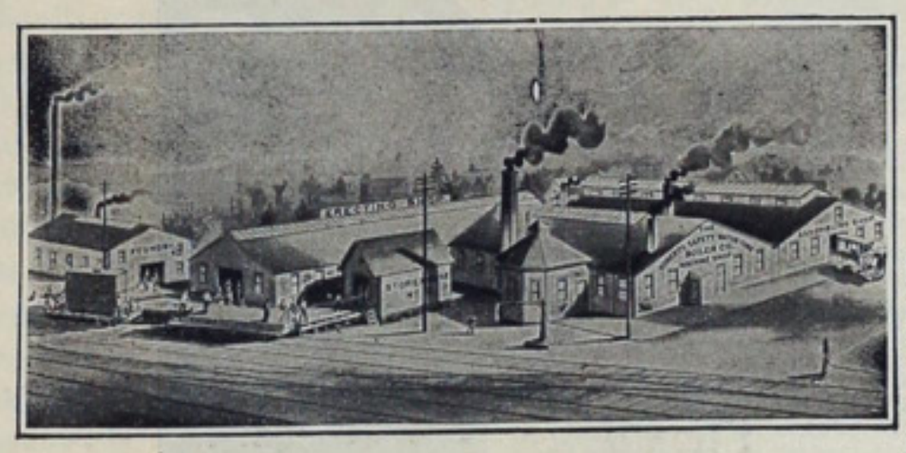

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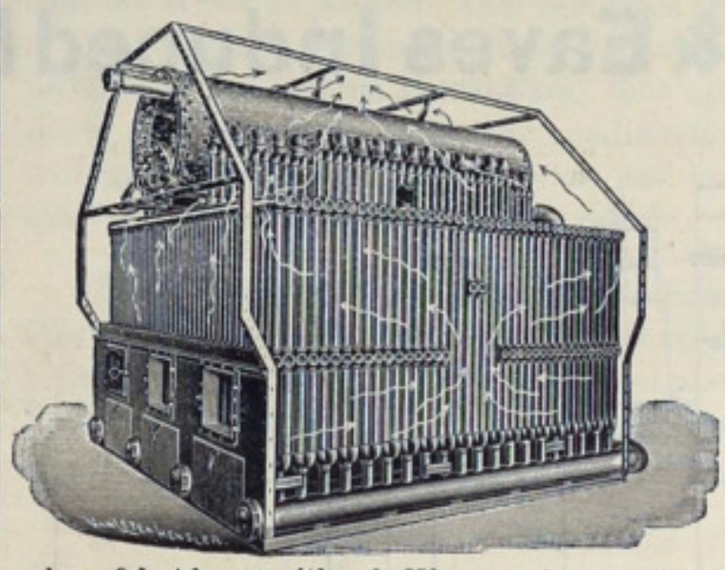

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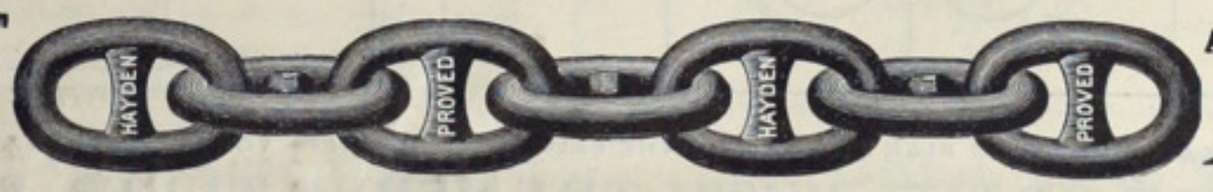

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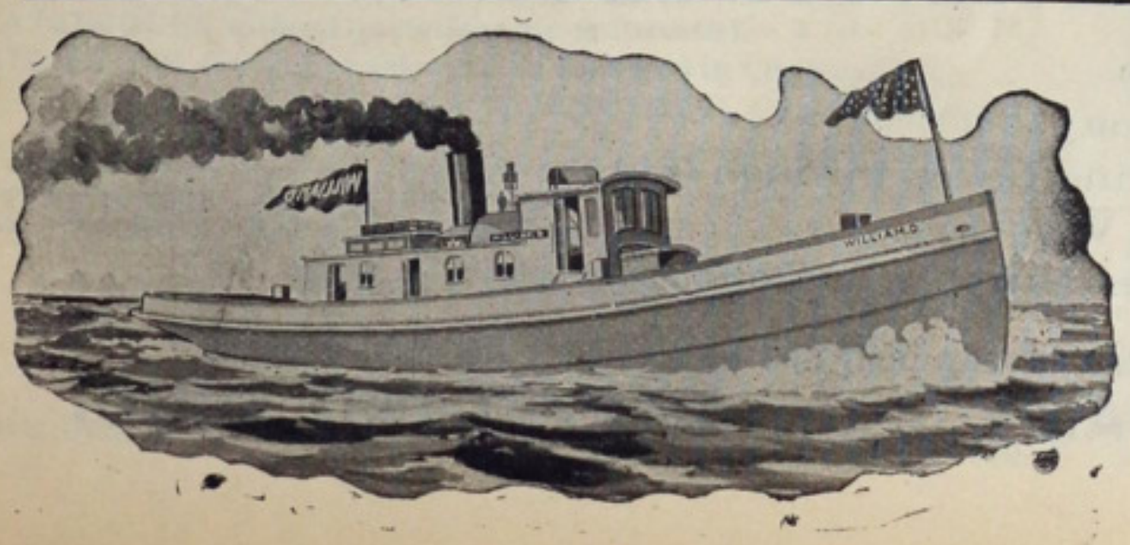

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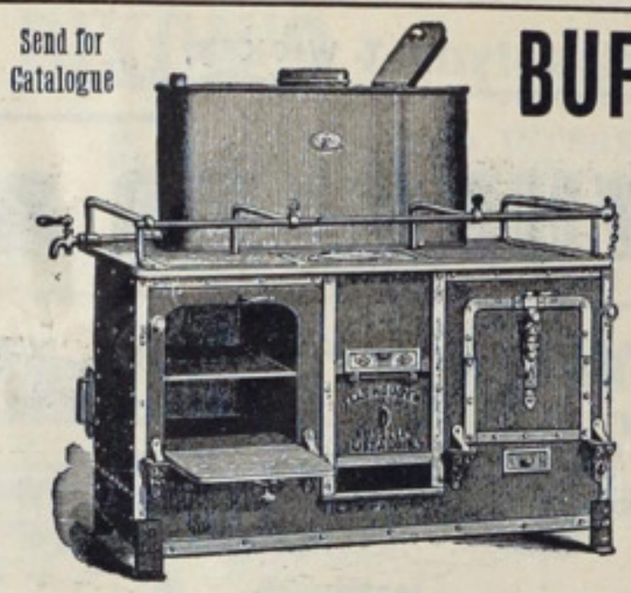

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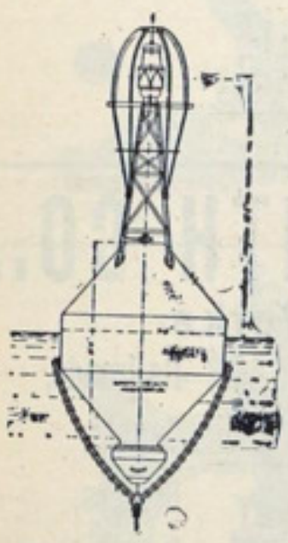

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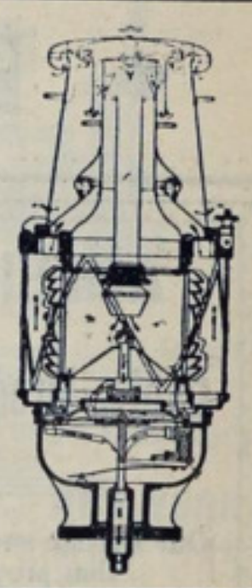

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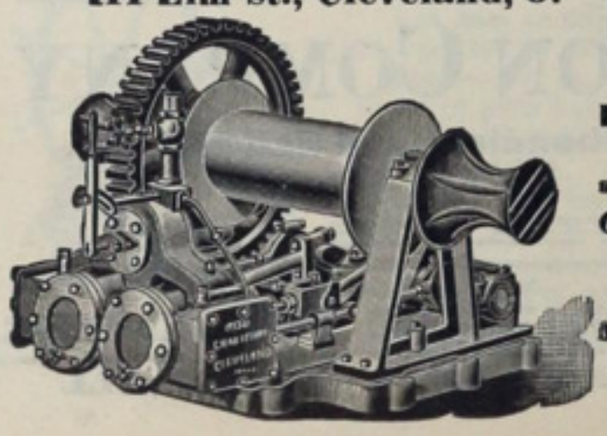

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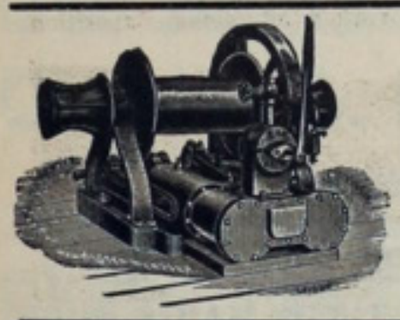

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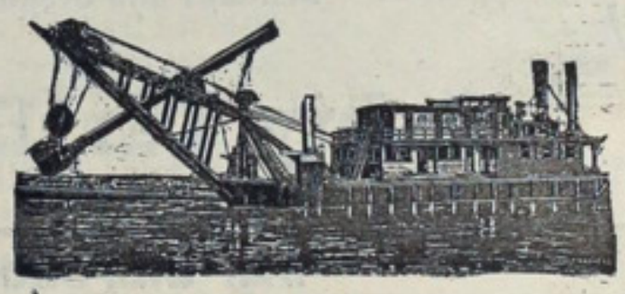

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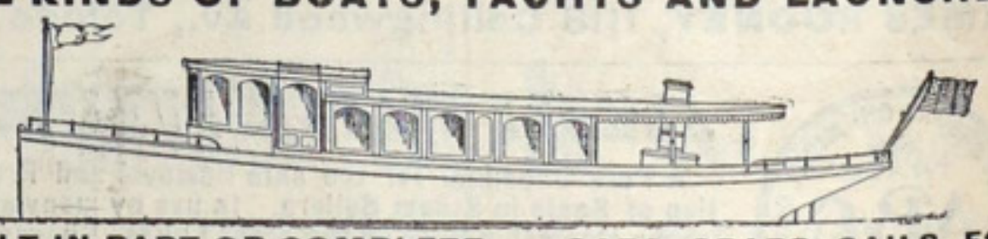

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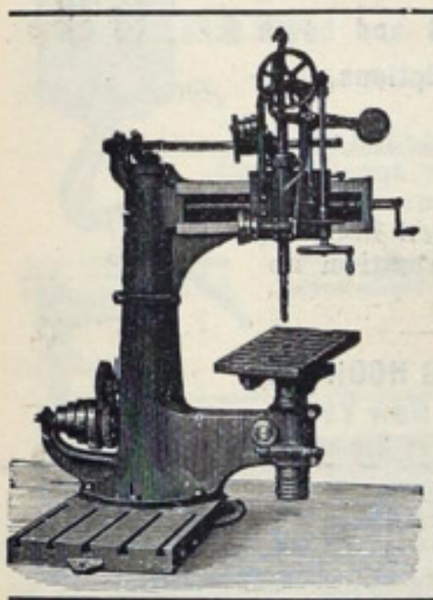

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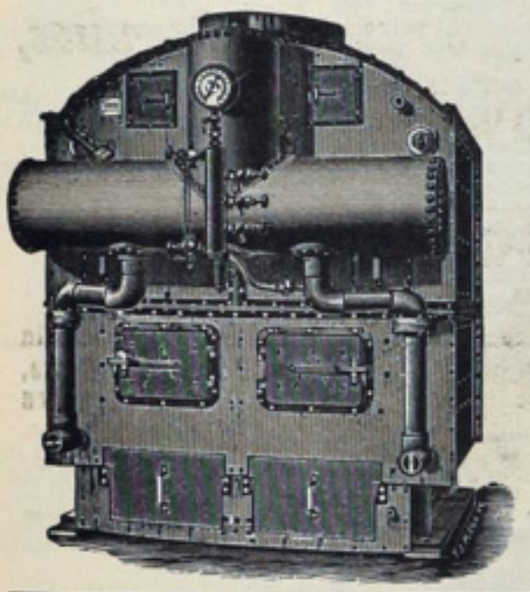

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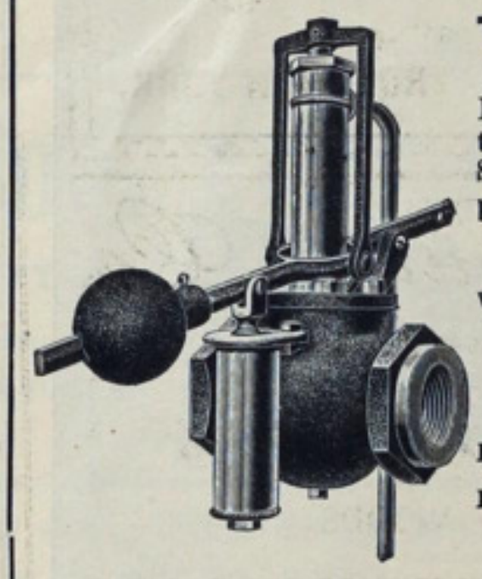

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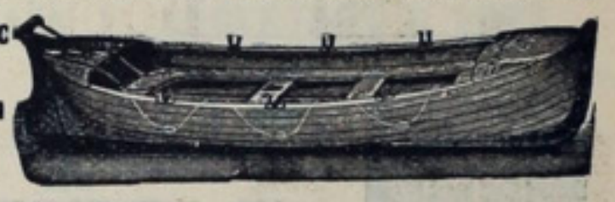

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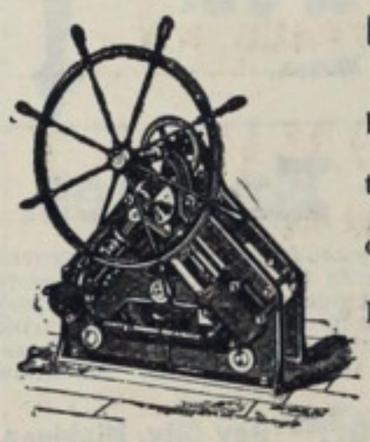

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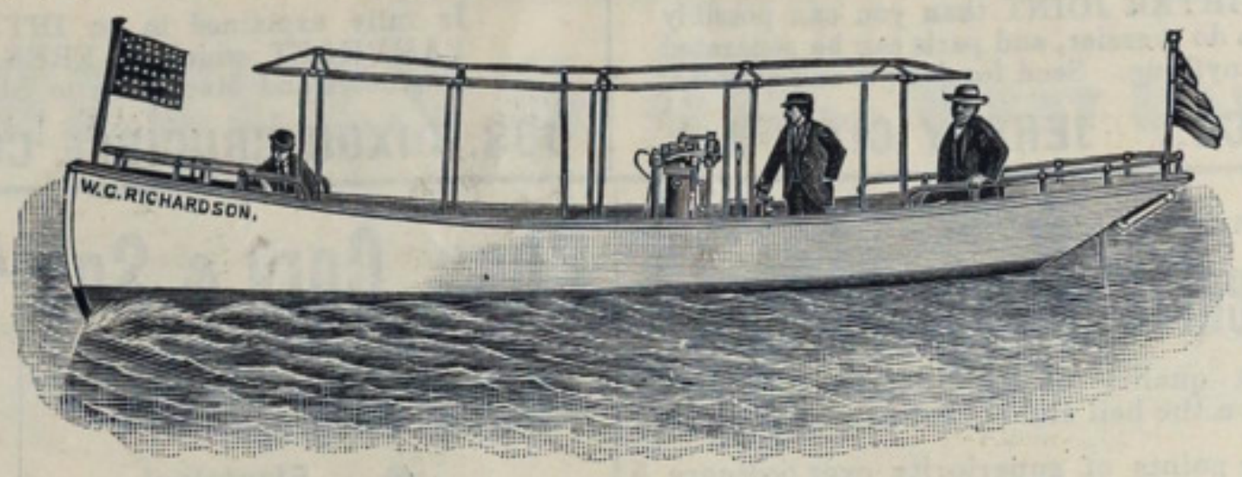

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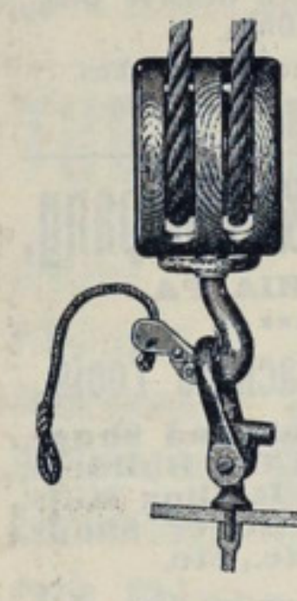

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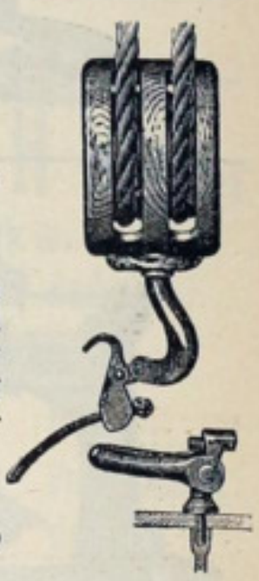

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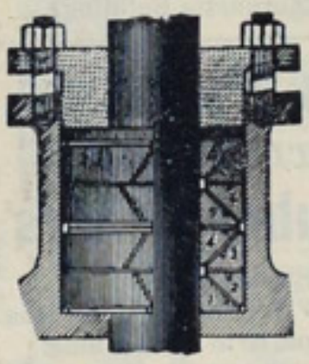

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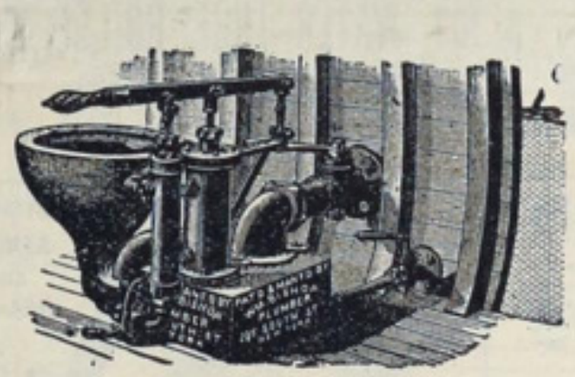

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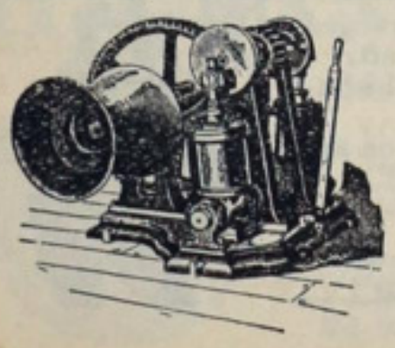

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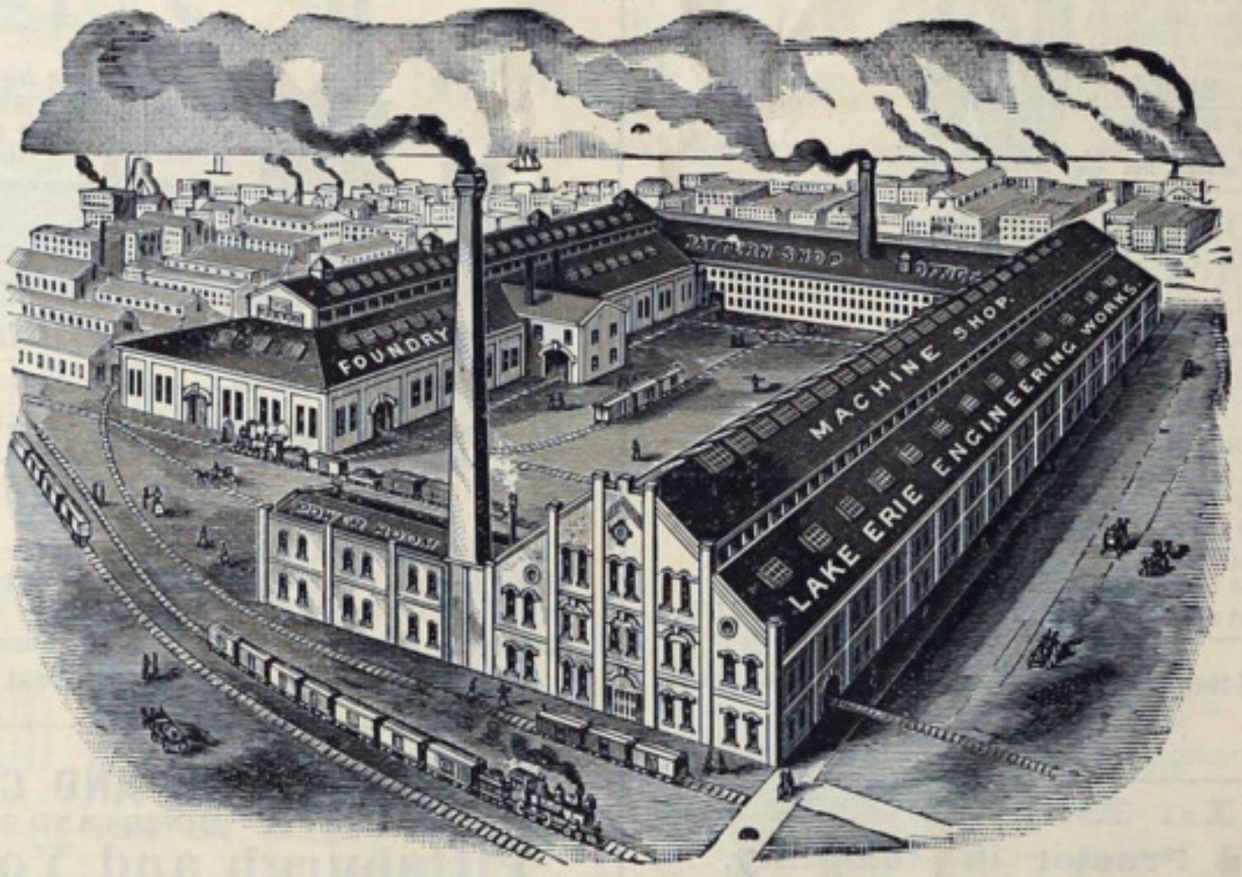

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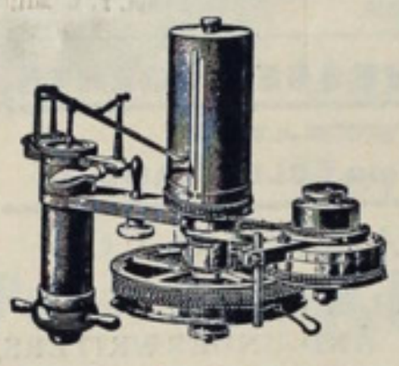

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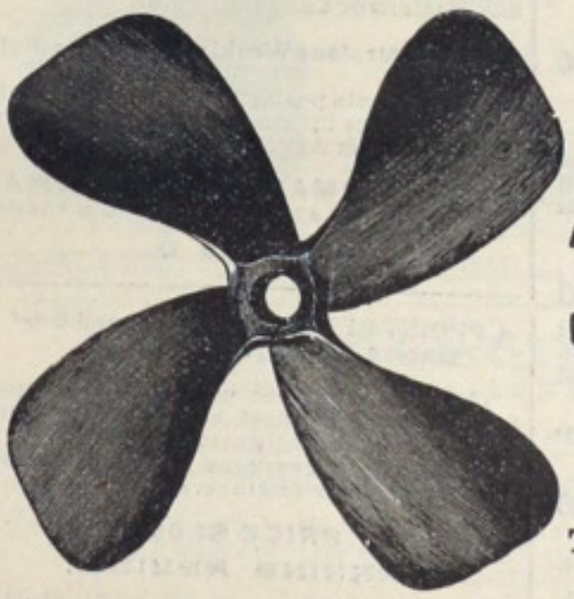

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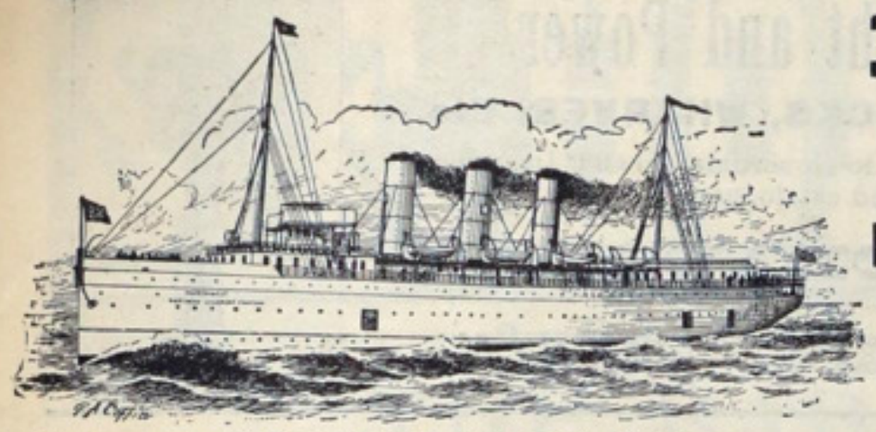

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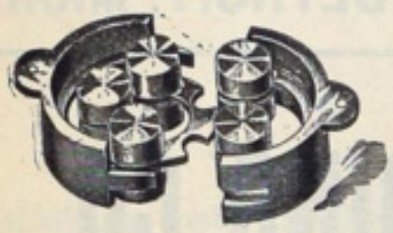

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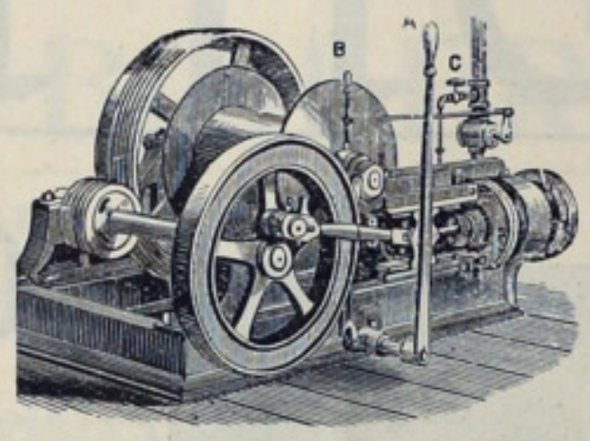

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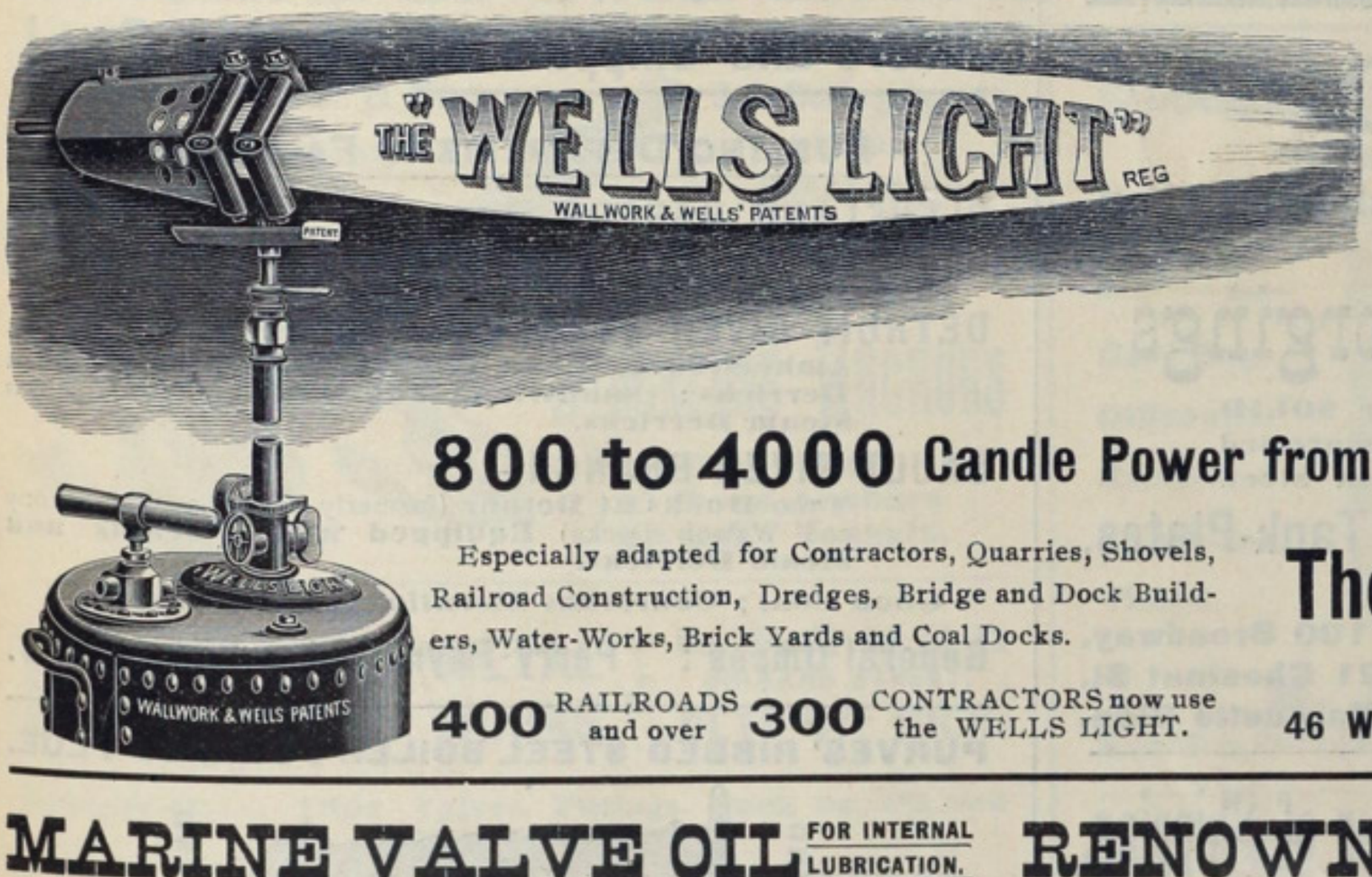

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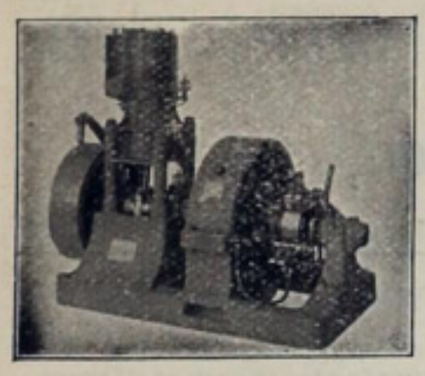

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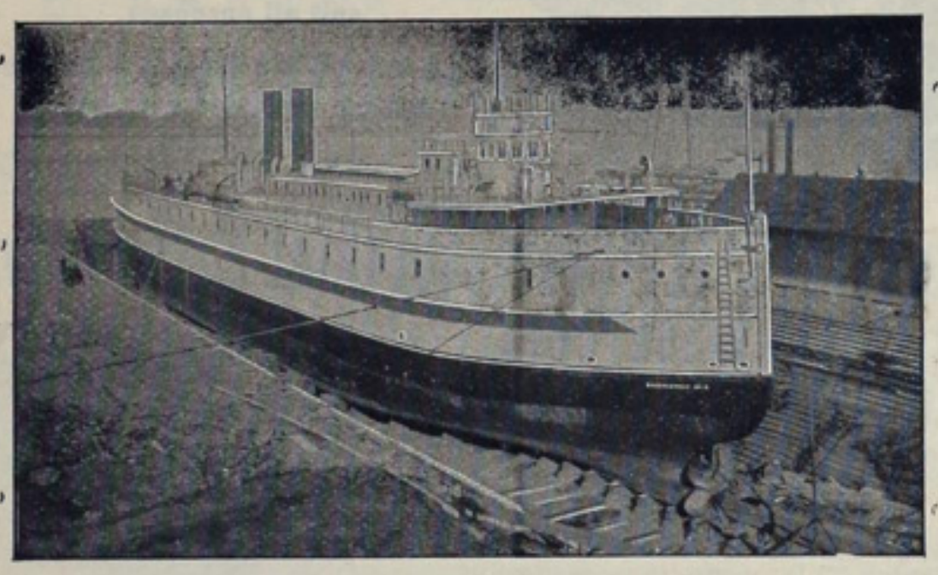

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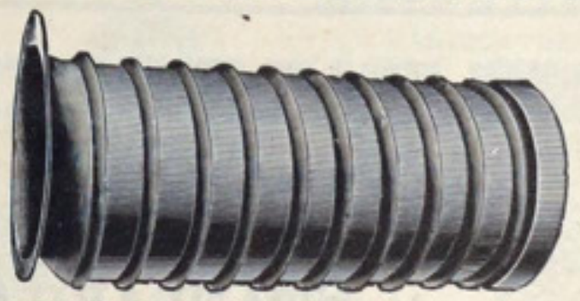

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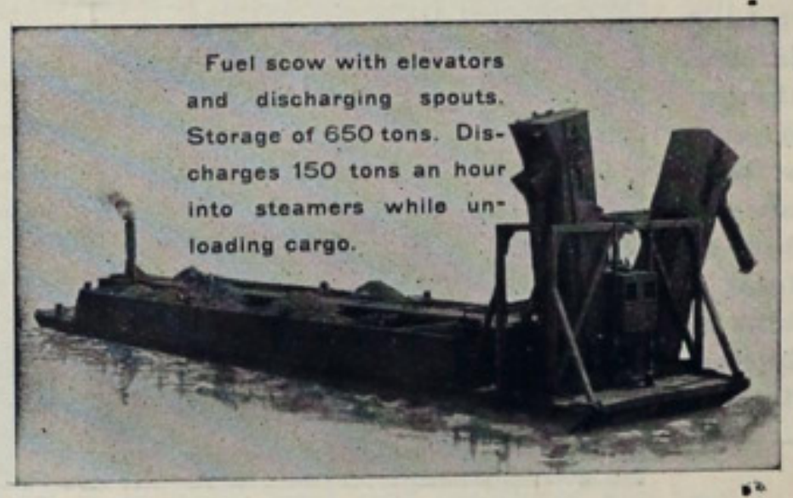
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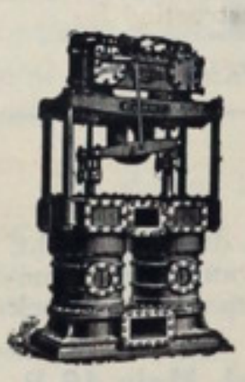
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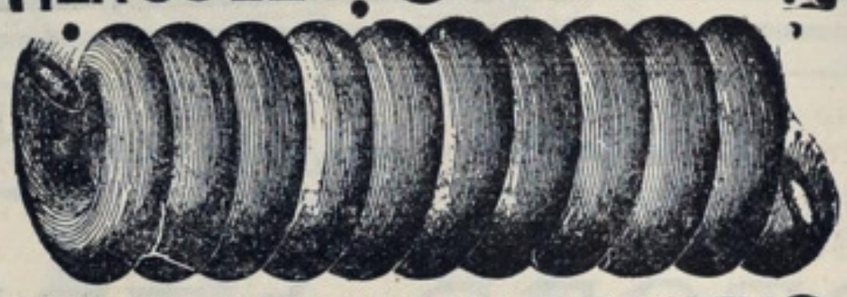

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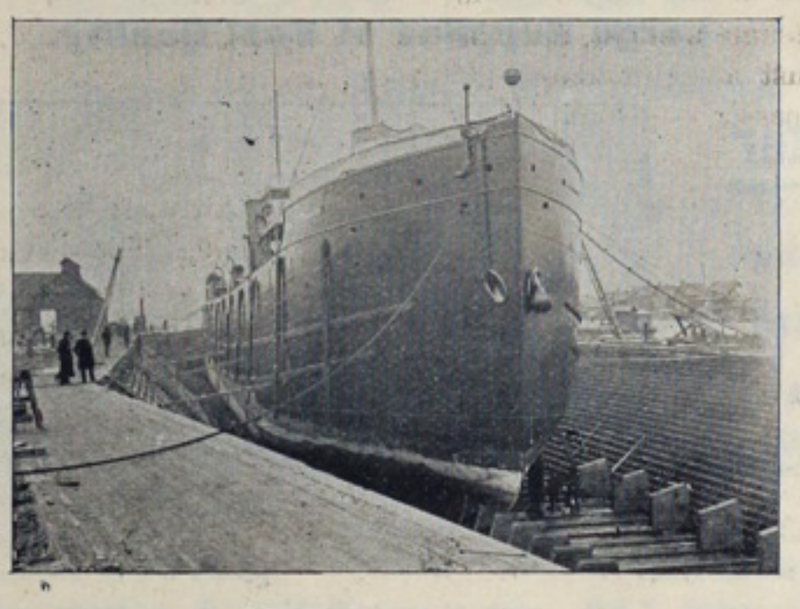

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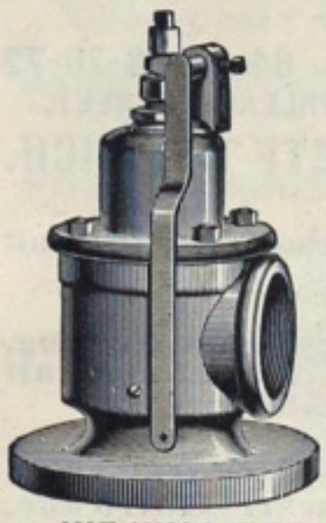

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